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NOTES FROM PACIFIC COAST OBSERVATORIES.

VISUAL OBSERVATIONS OF HALLEY'S COMET, JANUARY-MAY, 1910.

A brief note in Number 129 of these *Publications* describes the visual observations of Halley's Comet which were made in December, 1909. Additional micrometric measures of the comet's position have been secured on the following dates: January 28th, 29th, February 11th, 28th, and March 11th, before conjunction with the Sun; May 5th and 15th, when the comet was a morning object; and May 20th, when the comet had once more passed to the east of the Sun. These measures were all made with the 12-inch telescope, and on March 11th and May 15th the hour-angle at the time of observation exceeded six hours.

The comet was first seen in the morning sky on the night of April 12th (morning of April 13th, civil time), when it was estimated to be of about the fifth magnitude, and had a well-defined nucleus of strong orange-yellow color and a faint bushy tail. After transiting the Sun, the comet was seen in the western sky on the evening of May 19th at about 7:30 P. S. T., and a good circle reading position was secured. On the following evening, May 20th, an accurate position observation was made by referring the comet to the 7.2 magnitude star A. G. Berlin A 1724. During the measures the comet moved from the north-preceding to the south-following side of the star, passing so close to it that at the instant of conjunction in right ascension the star and nucleus were separated by only about 6''. So far as could be determined by eye estimates, the star's brightness was not affected by this transit of the coma.

During the period of greatest brightness of the comet the instrumental equipment of the observatory was principally

devoted to securing as complete as possible a set of spectrographic, photographic, and polariscopic observations. The nucleus and coma were, however, examined visually with the 36-inch refractor on the nights of Tuesday, May 10th, and Friday, May 13th (astronomical dates; civil time, Wednesday and Saturday mornings, respectively), and with the 12-inch on the evening of May 20th. On May 10th the nucleus appeared as a small, round disk, ten settings of the micrometer, in various positions angles, giving a mean diameter of $2''.6$. On the north-following side (toward the Sun) were well-defined, quite bright envelopes, while on the south-preceding side was an equally well-defined parabolic-shaped shadow effect, the vertex being tangent to the nucleus, and the axis extending in the position angle 251° . The contrast in brightness on the two sides of the nucleus was so strong that it was difficult to realize that it was merely a contrast effect and not an actual shadow that was seen.

On May 13th the shadow effect was again seen, the axis lying in position-angle 281° (at $15^h\ 35^m$ P. S. T.), but instead of bright envelopes in front of the nucleus (toward the Sun), there were two bright wings, from $40''$ to $45''$ in length, extending from the nucleus in position-angles 251° and 322° , respectively. The south-preceding wing was the brighter, broader, and rather shorter of the two. These wings did not envelope the nucleus, but appeared to originate from the side of the nucleus away from the Sun, generally appearing tangent to it and at times almost detached from it. The seeing was only fair on both mornings.

On the evening of May 20th a bright envelope was seen on the side toward the Sun, and in front of, or outside of this, a secondary, much fainter envelope. Measures from the nucleus in the approximate axis of the tail gave the breadth of $73''$ to the inner envelope, while the outer edge of the secondary one lay fully $180''$ from the nucleus (at $8^h\ 24^m$ P. S. T.). In a line through the nucleus at right angles to the axis, the outer edges of the bright envelope lay about $4'$ from the nucleus, the south-following wing being somewhat brighter and broader than the other. The axis of the shadow-effect lay in position-angle 46° .

The short exposure photographs of the comet's head obtained with the Crossley reflector on these dates will afford data for a more accurate study of these phenomena.

Watch was kept by the writer of the appearance of the comet's tail in the morning sky up to and including Saturday morning, May 21st. The tail extended to the Milky Way in *Aquila* on several mornings, but on no occasion could I see it beyond the Milky Way. On the morning of the 18th it was very bright, on the morning of the 19th the axis lay somewhat farther to the north, and the tail was fainter, though still very prominent, and to the south of it could faintly be seen the cone of the zodiacal light. On the morning of the 20th (civil time) the tail was still visible, being roughly about one third as bright as on the preceding day, but still distinctly brighter than the zodiacal light. It could readily be followed from the horizon to the Milky Way. On the morning of the 21st, however, no trace of it could be seen, though careful watch was kept from the time the Moon entered the deep haze on the western horizon until the Milky Way faded in the dawn. On the evening of the 19th of May a faint orange glow in the western sky, extending for a short distance from the position of the comet's head away from the Sun, marked the position of the comet's tail, and on the 20th, in spite of the bright moonlight, the tail could be traced distinctly for fully ten degrees.

R. G. AITKEN.

June 2, 1910.

SPECTROGRAPHIC ORBIT OF β CAPRICORNI.

The orbit of the spectroscopic binary β *Capricorni* ($a = 20^{\text{h}} 15^{\text{m}}.4$, $\delta = -15^{\circ} 5'$) has been computed from plates obtained at the Lick Observatory with the Mills three-prism spectrograph and 36-inch equatorial.

The spectrum is given as composite in the Harvard classification, but only the brighter component is recorded on these plates. It is approximately solar type. Forty-five observations were used.

The preliminary elements were found by plotting the observations, reduced to one cycle, and applying well-known graphical methods. They were corrected by trial and error. The